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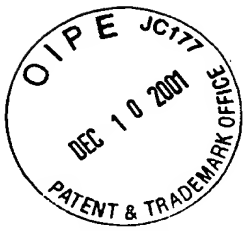

SEQUENCE LISTING

<110> Mose Larsen, Peter

Fey, Stephen J

Nerup, Jorn

Karlsen, Allan

Bjerre Christensen, Ulla

Pociot, Flemming

Andersen, Henrik U

<120> Diabetes-Mediating Proteins and Therapeutic Uses Thereof

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<140> US 09/297,040

<141> 1999-07-21

<150> PCT/IB97/01627

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<150> US 08/897,098

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<150> US 60/029,324

<151> 1996-10-25

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<151> 1996-11-05

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Ala Ser Arg Ser Pro Ala Ala Ala Arg Pro Gln Asp Gly Trp Asn Gly
            20                  25                  30

Leu Ser His Glu Ala Phe Arg Phe Val Ser Arg Asp Tyr Ala Ser Glu
        35                  40                  45

Ala Ile Lys Gly Ala Val Val Gly Ile Asp Leu Gly Thr Thr Asn Ser
    50                  55                  60

Cys Val Ala Val Met Glu Gly Lys Gln Ala Lys Val Leu Glu Asn Ala
65                  70                  75                  80

Glu Gly Ala Arg Thr Thr Pro Ser Val Val Ala Phe Thr Ala Asp Gly
                85                  90                  95

Glu Arg Leu Val Met Pro Ala Lys Arg Gln Ala Val Thr Asn Pro Asn
            100                 105                 110
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Asn Thr Phe Tyr Ala Thr Lys Arg Leu Ile Gly Arg Arg Tyr Asp Asp
        115                 120                 125

Pro Glu Val Gln Lys Asp Thr Lys Asn Val Pro Phe Lys Ile Val Arg
    130                 135                 140

Ala Ser Asn Gly Asp Ala Trp Val Glu Ala His Gly Lys Tyr Ser Pro
145                 150                 155                 160

Ser Gln Ile Gly Ala Phe Val Leu Met Lys Met Lys Glu Thr Ala Glu
                165                 170                 175

Asn Tyr Leu Gly His Thr Ala Lys Asn Ala Val Ile Thr Val Pro Ala
            180                 185                 190

Tyr Phe Asn Asp Ser Gln Arg Gln Ala Thr Lys Asp Ala Gly Gln Ile
        195                 200                 205

Ser Gly Leu Asn Val Leu Val Ile Asn Glu Pro Thr Ala Ala Ala Leu
    210                 215                 220

Ala Tyr Gly Leu Asp Lys Ser Glu Asp Lys Val Ile Ala Val Tyr Asp
225                 230                 235                 240

Leu Gly Gly Gly Thr Phe Asp Ile Ser Ile Leu Glu Ile Gln Lys Gly
                245                 250                 255

Val Phe Glu Val Lys Ser Thr Asn Gly Asp Thr Phe Leu Gly Gly Asp
            260                 265                 270

Phe Asp Gln Ala Leu Leu Arg His Ile Val Lys Glu Phe Lys Arg Glu
        275                 280                 285

Thr Gly Val Asp Leu Thr Lys Asp Asn Met Ala Leu Gln Arg Val Arg
    290                 295                 300

Glu Ala Ala Glu Lys Ala Lys Cys Glu Leu Ser Ser Ser Val Gln Thr
305                 310                 315                 320

Asp Ile Asn Leu Pro Tyr Leu Thr Asp Ala Ser Gly Pro Lys His Leu
                325                 330                 335
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Asn Met Lys Leu Thr Arg Ala Gln Phe Glu Gly Ile Val Thr Asp Leu
            340                 345                 350

Ile Lys Arg Thr Ile Ala Pro Cys Gln Lys Ala Met Gln Asp Ala Glu
        355                 360                 365

Val Ser Lys Ser Asp Ile Gly Glu Val Ile Leu Val Gly Gly Met Thr
    370                 375                 380

Arg Pro Lys Val Gln Gln Thr Val Gln Asp Leu Phe Gly Arg Ala Pro
385                 390                 395                 400

Ser Lys Ala Val Asn Pro Asp Glu Ala Val Ala Ile Gly Ala Ala Ile
                405                 410                 415

Gln Gly Gly Val Leu Ala Gly Asp Val Thr Asp Val Leu Leu Leu Asp
            420                 425                 430

Val Thr Pro Leu Ser Leu Gly Ile Glu Thr Gly Gly Val Phe Thr Lys
        435                 440                 445

Leu Ile Asn Arg Asn Thr Thr Ile Pro Thr Lys Lys Ser Gln Val Phe
    450                 455                 460

Ser Thr Ala Ala Asp Gly Gln Thr Gln Val Glu Ile Lys Val Cys Gln
465                 470                 475                 480

Gly Glu Arg Glu Met Ala Gly Asp Asn Lys Leu Leu Gly Gln Phe Thr
                485                 490                 495

Leu Ile Gly Pro Pro Ala Pro Arg Gly Val Pro Gln Ile Glu Val Thr
            500                 505                 510

Phe Asp Ile Asp Ala Asn Gly Ile Val His Val Ser Ala Lys Asp Lys
        515                 520                 525

Gly Thr Gly Arg Glu Gln Gln Ile Val Ile Gln Ser Ser Gly Gly Leu
    530                 535                 540

Ser Lys Asp Asp Ile Glu Asn Met Val Lys Asn Ala Lys Tyr Ala Glu
545                 550                 555                 560
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Glu Asp Arg Arg Lys Lys Glu Arg Val Glu Ala Val Asn Met Ala Glu
565 570 575

Gly Ile Ile His Asp Thr Glu Thr Lys Met Glu Glu Phe Lys Asp Gln
580 585 590

Leu Pro Ala Asp Glu Cys Asn Lys Leu Lys Glu Glu Ile Ser Lys Val
595 600 605

Arg Ala Leu Leu Ala Lys Asp Ser Glu Thr Gly Glu Asn Ile Arg Gln
610 615 620

Ala Ala Ser Ser Leu Gln Gln Ala Ser Leu Lys Leu Phe Glu Met Ala
625 630 635 640

Tyr Lys Lys Met Ala Ser Glu Arg Glu Gly Ser Gly Ser Ser Gly Thr
645 650 655

Gly Glu Gln Lys Glu Asp Gln Lys Glu Glu Lys Gln
660 665

<210> 2

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<212> PRT

<213> Homo sapiens

<400> 2

Met Ile Ser Ala Ser Arg Ala Ala Ala Ala Arg Leu Val Gly Ala Ala
1 5 10 15

Ala Ser Arg Gly Pro Thr Ala Ala Arg His Gln Asp Ser Trp Asn Gly
20 25 30

Leu Ser His Glu Ala Phe Arg Leu Val Ser Arg Asp Tyr Ala Ser Glu
35 40 45

Ala Ile Lys Gly Ala Val Val Gly Ile Asp Leu Gly Thr Thr Asn Ser
50 55 60

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Cys Val Ala Val Met Glu Gly Lys Gln Ala Lys Val Leu Glu Asn Ala
65                  70                  75                  80

Glu Gly Ala Arg Thr Thr Pro Ser Val Val Ala Phe Thr Ala Asp Gly
                85                  90                  95

Glu Arg Leu Val Met Pro Ala Lys Arg Gln Ala Val Thr Asn Pro Asn
            100                 105                 110

Asn Thr Phe Tyr Ala Thr Lys Arg Leu Ile Gly Arg Arg Tyr Asp Asp
        115                 120                 125

Pro Glu Val Gln Lys Asp Ile Lys Asn Val Pro Phe Lys Ile Val Arg
    130                 135                 140

Ala Ser Asn Gly Asp Ala Trp Val Glu Ala His Gly Lys Tyr Ser Pro
145                 150                 155                 160

Ser Gln Ile Gly Ala Phe Val Leu Met Lys Met Lys Glu Thr Ala Glu
                165                 170                 175

Asn Tyr Leu Gly His Thr Ala Lys Asn Ala Val Ile Thr Val Pro Ala
            180                 185                 190

Tyr Phe Asn Asp Ser Gln Arg Gln Ala Thr Lys Asp Ala Gly Gln Ile
        195                 200                 205

Ser Gly Leu Asn Val Leu Val Ile Asn Glu Pro Thr Ala Ala Ala Leu
    210                 215                 220

Ala Tyr Gly Leu Asp Lys Ser Glu Asp Lys Val Ile Ala Val Tyr Asp
225                 230                 235                 240

Leu Gly Gly Gly Thr Phe Asp Ile Ser Ile Leu Glu Ile Gln Lys Gly
                245                 250                 255

Val Phe Glu Val Lys Ser Thr Asn Gly Asp Thr Phe Leu Gly Gly Asp
            260                 265                 270

Phe Asp Gln Ala Leu Leu Arg His Ile Val Lys Glu Phe Lys Arg Glu
        275                 280                 285
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Thr Gly Val Asp Leu Thr Lys Asp Asn Met Ala Leu Gln Arg Val Arg
    290                 295                 300

Glu Ala Ala Glu Lys Ala Lys Cys Glu Leu Ser Ser Ser Val Gln Thr
305                 310                 315                 320

Asp Ile Asn Leu Pro Tyr Leu Thr Asp Ser Ser Gly Pro Lys His Leu
                325                 330                 335

Asn Met Lys Leu Thr Arg Ala Gln Phe Glu Gly Ile Val Thr Asp Leu
            340                 345                 350

Ile Arg Arg Thr Ile Ala Pro Cys Gln Lys Ala Met Gln Asp Ala Glu
        355                 360                 365

Val Ser Lys Ser Asp Ile Gly Glu Val Ile Leu Val Gly Gly Met Thr
    370                 375                 380

Arg Pro Lys Val Gln Gln Thr Val Gln Asp Leu Phe Gly Arg Ala Pro
385                 390                 395                 400

Ser Lys Ala Val Asn Pro Asp Glu Ala Val Ala Ile Gly Ala Ala Ile
                405                 410                 415

Gln Gly Gly Val Leu Ala Gly Asp Val Thr Asp Val Leu Leu Leu Asp
            420                 425                 430

Val Thr Pro Leu Ser Leu Gly Ile Glu Thr Gly Gly Val Phe Thr Lys
        435                 440                 445

Leu Ile Asn Arg Asn Thr Thr Ile Pro Thr Lys Lys Ser Gln Val Phe
    450                 455                 460

Ser Thr Ala Ala Asp Gly Gln Thr Gln Val Glu Ile Lys Val Cys Gln
465                 470                 475                 480

Gly Glu Arg Glu Met Ala Gly Asp Asn Lys Leu Leu Gly Gln Phe Thr
                485                 490                 495

Leu Ile Gly Pro Pro Ala Pro Arg Gly Val Pro Gln Ile Glu Val Thr
            500                 505                 510
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Phe Asp Ile Asp Ala Asn Gly Ile Val His Val Ser Ala Lys Asp Lys
515 520 525

Gly Thr Arg Arg Glu Gln Gln Ile Val Ile Gln Ser Ser Gly Gly Leu
530 535 540

Ser Lys Asp Asp Ile Glu Asn Met Val Lys Asn Ala Lys Tyr Ala Glu
545 550 555 560

Glu Asp Arg Arg Lys Lys Glu Arg Val Glu Ala Val Asn Met Ala Glu
565 570 575

Gly Ile Ile His Asp Thr Glu Thr Lys Met Glu Glu Phe Lys Asp Gln
580 585 590

Leu Pro Ala Asp Glu Cys Asn Lys Leu Lys Glu Glu Ile Ser Lys Met
595 600 605

Arg Glu Leu Leu Ala Lys Asp Ser Glu Thr Gly Glu Asn Ile Arg Gln
610 615 620

Ala Ala Ser Ser Leu Gln Gln Ala Ser Leu Lys Leu Phe Glu Met Ala
625 630 635 640

Tyr Lys Lys Met Ala Ser Glu Arg Glu Gly Ser Gly Ser Ser Gly Thr
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Gly Glu Gln Lys Glu Asp Gln Lys Glu Glu Lys Gln
660 665

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<213> Rattus sp.

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Pro Asn Pro Arg Gly Trp Pro Gly Ala Trp Gly Asn Gln Pro Gly Ala
            20                  25                  30

Gly Gly Tyr Pro Gly Ala Ser Tyr Pro Gly Ala Pro Gly Gln Ala Pro
        35                  40                  45

Pro Gly Gly Tyr Pro Gly Gln Ala Pro Pro Ser Ala Tyr Pro Gly Pro
    50                  55                  60

Thr Gly Pro Ser Ala Tyr Pro Gly Pro Thr Ala Pro Gly Ala Tyr Pro
65                  70                  75                  80

Gly Pro Thr Ala Pro Gly Ala Phe Pro Gly Gln Pro Gly Gly Pro Gly
                85                  90                  95

Ala Tyr Pro Ser Pro Gly Ala Tyr Pro Ser Ala Pro Gly Ala Tyr Pro
            100                 105                 110

Ala Thr Gly Pro Phe Gly Ala Pro Thr Gly Pro Leu Thr Val Pro Tyr
        115                 120                 125

Asp Met Pro Leu Pro Gly Gly Val Met Pro Arg Met Leu Ile Thr Ile
    130                 135                 140

Ile Gly Thr Val Lys Pro Asn Ala Asn Ser Ile Thr Leu Phe Lys Lys
145                 150                 155                 160

Gly Asn Asp Ile Ala Phe His Phe Asn Pro Arg Phe Asn Glu Asn Asn
                165                 170                 175

Arg Arg Val Ile Val Cys Asn Thr Lys Gln Asp Asn Asn Trp Gly Arg
            180                 185                 190

Glu Glu Arg Gln Ser Ala Phe Pro Phe Glu Ser Gly Lys Pro Phe Lys
        195                 200                 205

Ile Gln Val Leu Val Glu Asp His Phe Lys Val Ala Val Asn Asp Val
    210                 215                 220

His Leu Leu Gln Tyr Asn His Arg Met Lys Asn Leu Arg Glu Ile Ser
225                 230                 235                 240
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Gln Leu Gly Ile Ile Gly Asp Ile Thr Leu Thr Ser Ala Ser His Ala
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Met Ile

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<212> PRT

<213> Homo sapiens

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Met Ala Asp Asn Phe Ser Leu His Asp Ala Leu Ser Gly Ser Gly Asn
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Pro Asn Pro Gln Gly Trp Pro Gly Ala Trp Gly Asn Gln Pro Ala Gly
20 25 30

Ala Gly Gly Tyr Pro Gly Ala Ser Tyr Pro Gly Tyr Pro Gly Gln Ala
35 40 45

Pro Pro Gly Ala Tyr Pro Gly Gln Ala Pro Pro Gly Ala Tyr His Gly
50 55 60

Ala Pro Gly Ala Tyr Pro Gly Ala Pro Ala Pro Gly Val Tyr Pro Gly
65 70 75 80

Pro Pro Ser Gly Pro Gly Ala Tyr Pro Ser Ser Gly Gln Pro Ser Ala
85 90 95

Pro Gly Ala Tyr Ala Thr Gly Pro Tyr Gly Ala Pro Ala Gly Pro Leu
100 105 110

Ile Val Pro Tyr Asn Leu Pro Leu Pro Gly Gly Val Val Pro Arg Met
115 120 125

Leu Ile Thr Ile Leu Gly Thr Val Lys Pro Asn Ala Asn Arg Ile Ala
130 135 140

```
Leu Asp Phe Gln Arg Gly Asn Asp Val Ala Phe His Phe Pro Arg Phe
145                 150                 155                 160

Asn Glu Asn Asn Arg Arg Val Ile Val Cys Asn Thr Lys Leu Asp Asn
                165                 170                 175

Asn Trp Gly Arg Glu Glu Arg Gln Ser Val Phe Pro Phe Glu Ser Gly
            180                 185                 190

Lys Pro Phe Lys Ile Gln Val Leu Val Glu Pro Asp His Phe Lys Val
        195                 200                 205

Ala Val Asn Asp Ala His Leu Gln Tyr Asn His Arg Val Lys Lys Leu
    210                 215                 220

Asn Glu Ile Ser Lys Leu Gly Ile Ser Gly Asp Ile Asp Leu Thr Ser
225                 230                 235                 240

Ala Ser Tyr Thr Met Ile
                245
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<212> PRT

<213> Rattus sp.

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Ala Gln Tyr Glu Glu Leu Ile Ala Asn Gly Asp Met
1               5                   10
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<211> 10

<212> PRT

<213> Rattus sp.

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Lys Lys Pro Leu Val Tyr Asp Glu Gly Lys
1 5 10

<210> 7

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<212> PRT

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1 5

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<223> X may be any amino acid

<400> 8

Pro Ser Leu Asn Ser Xaa Glu Xaa
1 5

<210> 9

<211> 7

<212> PRT

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<223> X may be any amino acid

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<222> (7)..(7)

<223> X may be any amino acid

<400> 9

Ile Glu Leu Xaa Glu Ile Xaa
1 5

<210> 10

<211> 14

<212> PRT

<213> Rattus sp.

<400> 10

Pro Glu Ala Ile Lys Gly Ala Val Val Gly Ile Asp Leu Gly
1 5 10